Porcupine Feeding

Pine Creek Plots

Pole-sized trees

To obtain data from which possible trends in porcupine feeding on ponderosa pine poles could be detected it was decided to base tests on tallies from 5 randomly selected subplots from each of the 7 Pine Creek plots or 35 subplots (each of 0.4 acres) in all. Each subplot thus had an equal chance of being taken for tally, with the exception that no subplot entirely lacking in pole-sized trees was taken. "Poles" included trees from 3.6 inches to 10.9 inches d.b.h. 1948 or 1949 d.b.h.'s were used and only feeding coded under these years considered.

These tallies are shown in table 1 of computations. As first tallied, Douglas-fir poles were included but, since only one Douglas-fir listed as fed on was found on the subplots selected and appears to be an error, the inclusion of Douglas-fir affected only the totals listed under "no feeding," and did not affect tallies under "portion of tree," "occurrence," and "defect." Later a tally of Douglas-fir

poles on these subplots was made and figures entered to indicate subtractions to be made under "no feeding" to reduce totals to read for ponderosa pine only. Chi-square analysis was employed, following methods shown in Snedecor's "Statistical Methods," Ed. 4, Ch. 9, to test the following hypotheses:

1. That the number of poles fed on is independent of the total number present.

   a. Douglas-fir and ponderosa pine combined (table 2).

   b. Ponderosa pine poles only (table 3).

2. That the number of instances of feeding in the first log-length is independent of the total number of instances occurring both in and above the first log length (table 4).

3. That occurrence of trees fed on more than once is independent of the number of trees on which feeding has occurred but once (table 5).

4. That the occurrence of porcupine-caused crook, fork, and spiketop defects (combined) is independent of the total number of porcupine-caused defects occurring (table 6).

The tallies and computations described above were carefully made and checked. However, a further tally (table 7) was made which shows some discrepancies, though these are not large enough to affect results appreciably.

In order to determine possible porcupine preferences in pole tree sizes (and to compare with Rudolf's results in Scotch pine, Lake States Forest Experiment Station Tech. note No. 307) the tally by d.b.h. class for ponderosa pine poles shown in table 7 was made and summed up for all 7 plots (35 subplots). Since it was desired to plot these figures (as percents), a further tally carrying d.b.h.'s up to 13.9 inches was made to better establish the curve shape. The trees for this extension were taken from the same subplots previously used.

Results are summarized on the computation sheets for each hypothesis tested, but are given also below:

For hypothesis 1 (a and b), the bias toward significant X^2 in the subplots and the highly significant X^2 for totaled data suggest rejection of the hypothesis and leads to the conclusion that interaction (lack of independence) exists. "The thicker the pole stand, the greater the percentage fed on" seems also borne out by the trends shown in figures 1 and 2, and is of possible use as an added argument for thinnings in pole thickets.

For hypothesis 2, evidence for or against the hypothesis is not clear for within- and between-plot comparisons but is stronger when significant X^2 is obtained for totaled data. There appears to be a relationship between the number of instances of feeding in the first log length and the total number of feedings in both the first log and higher portions of the trees.

For hypothesis 3, nonsignificant X^2 for all comparisons supports the idea that occurrence of trees fed on more than once is independent of the number of trees fed on but once.

For hypothesis 4, between-plot and totalled results discredit the hypothesis of independence, suggesting the existence of a relationship between the occurrence of crook, fork, and spiketop (combined) and the total number of porcupine-caused defects.

The above tests may be summarized from the standpoint of thinnings in heavily stocked pole stands of ponderosa pine as follows: since a preference for thickets has been indicated (under the first hypothesis) the thinnihgs would tend to reduce the percentage of poles attacked. Reducing the percentage fed on would also reduce the number of feedings (numbers of trees attacked and numbers of feedings coincide in 19 out of the 26 subplots on which feeding occurred and differ by from 1 to 4 on the other 7 subplots). This reduction would tend to reduce also the occurrence of damage caused by feeding in the first log-length (hypothesis 2) and would also tend to reduce numerically, if not percentage-wise, the occurrence of the more serious porcupine-caused defects of crook, fork, and spiketop (hypothesis 4).

Results for porcupine preferences in pole size trees are indicated in figure 3, where it is shown that, on the average, the percentage of poles fed on increases until the 8-10-inch classes are reached, then tends to drop. Where groups of trees, all near this 8-10-inch size occur, thinning may be advisable to reduce the proportion fed on. This peak on the plotted data may also indicate the size of tree to select in placing poison for porcupine control.

Curves drawn in figures 1, 2, and 3 are freehand and have not been balanced and are intended only to indicate probable trends.

Based on the 35 subplots (14 acres) used in computations above:

Average number poles/acre (pine and fir)	=151.5
Average number poles/acre (pine only)	=134.4
Average number poles/acre fed on (pine only)	= 20.2
Percent fed on (based on total pine and fir poles)	= 13.3 percent
Percent fed on (pine only)	= 15.0 percent

For ponderosa pine poles fed on:

percent fed on in first log	= 22.3 percent
Percent fed on more than once	= 11.7 percent
Percent having crook, fork, or spiketop	= 69.6 percent

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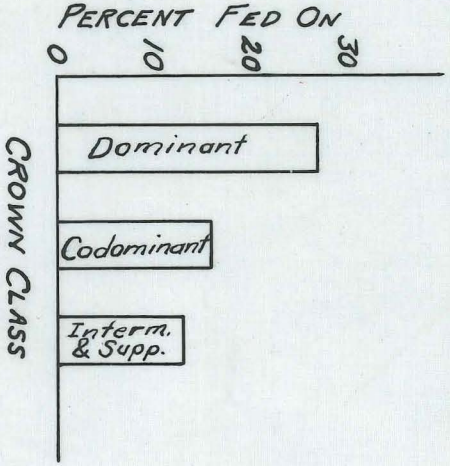
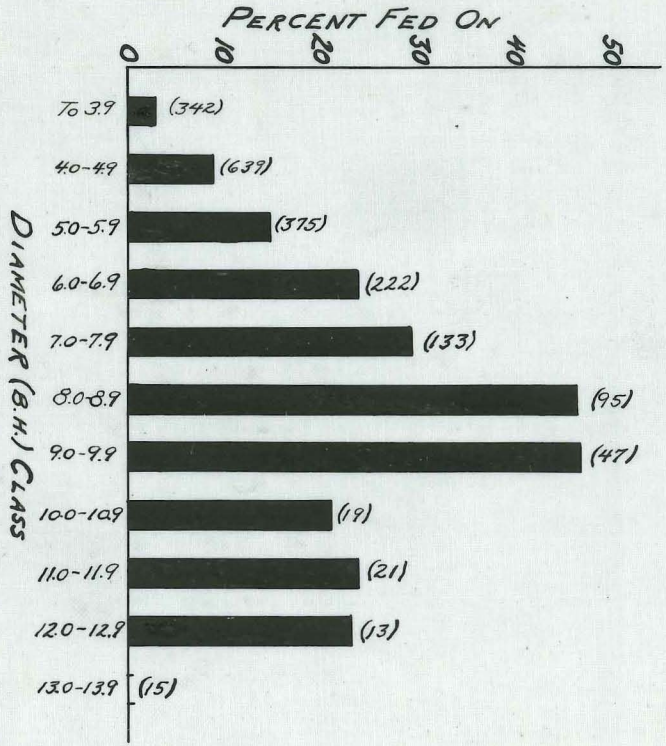
2/7/50


PERCENT FED ON
0
10
20
30
CROWN CLASS
Dominant
Codominant
Interm. & Supp.

Curtis


PERCENT FED ON
0
10
20
30
40
50
DIAMETER (B.H.) CLASS
To 3.9
(342)
4.0-4.9
(639)
5.0-5.9
(375)
6.0-6.9
(222)
7.0-7.9
(133)
8.0-8.9
(95)
9.0-9.9
(47)
10.0-10.9
(19)
11.0-11.9
(21)
12.0-12.9
(13)
13.0-13.9
(15)